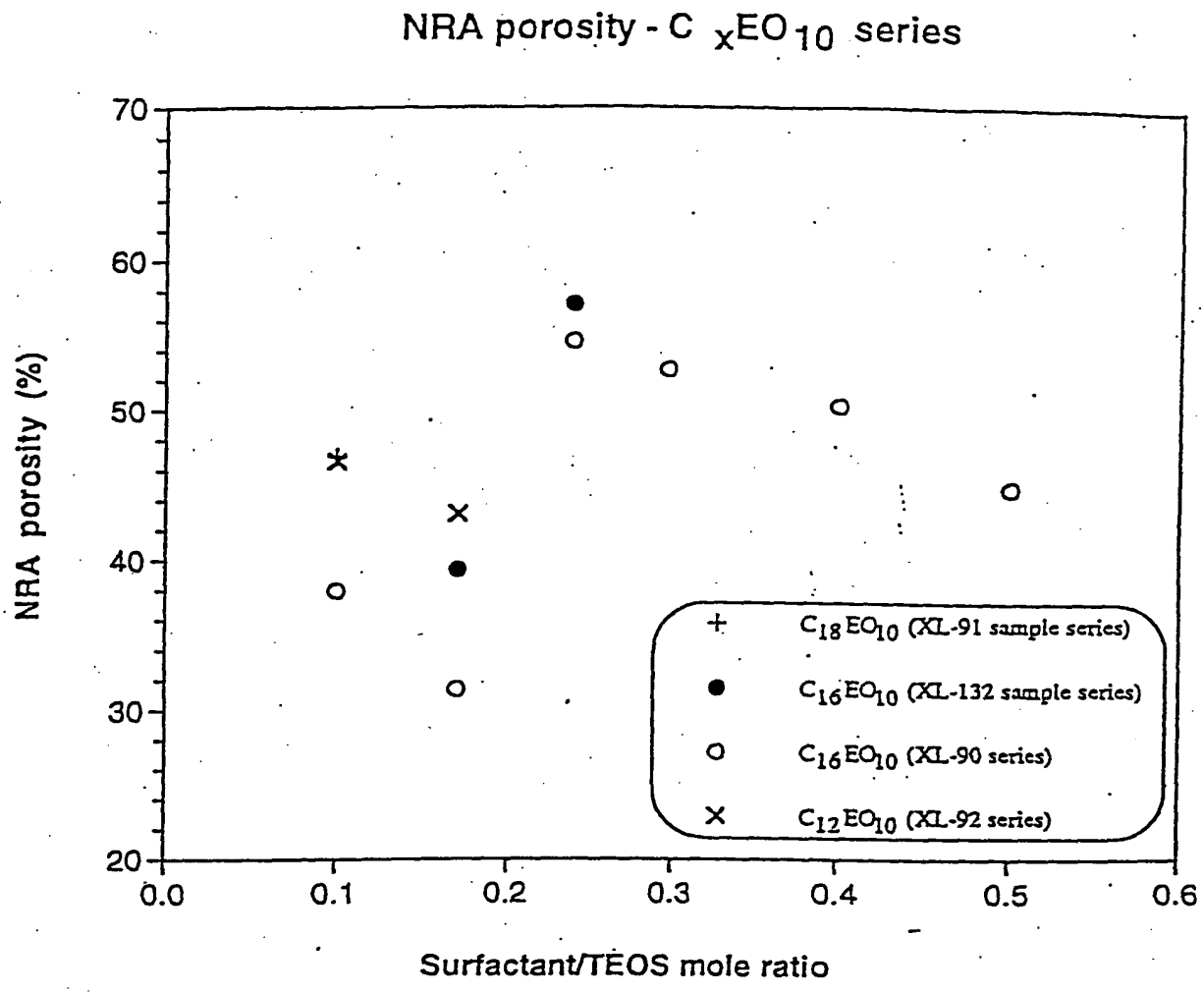

NRA porosity - C xEO10 series
NRA porosity (%)
70
60
50
40
30
20
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Surfactant/TEOS mole ratio
C18EO10 (XL-91 sample series)
C16EO10 (XL-132 sample series)
C16EO10 (XL-90 series)
C12EO10 (XL-92 series)

FIG. 1

$C_{12}EO_{10}$ based Films
Surfactant/TEOS mole ratio = 0.17

Effect of Dehydroxylation Treatments on k'

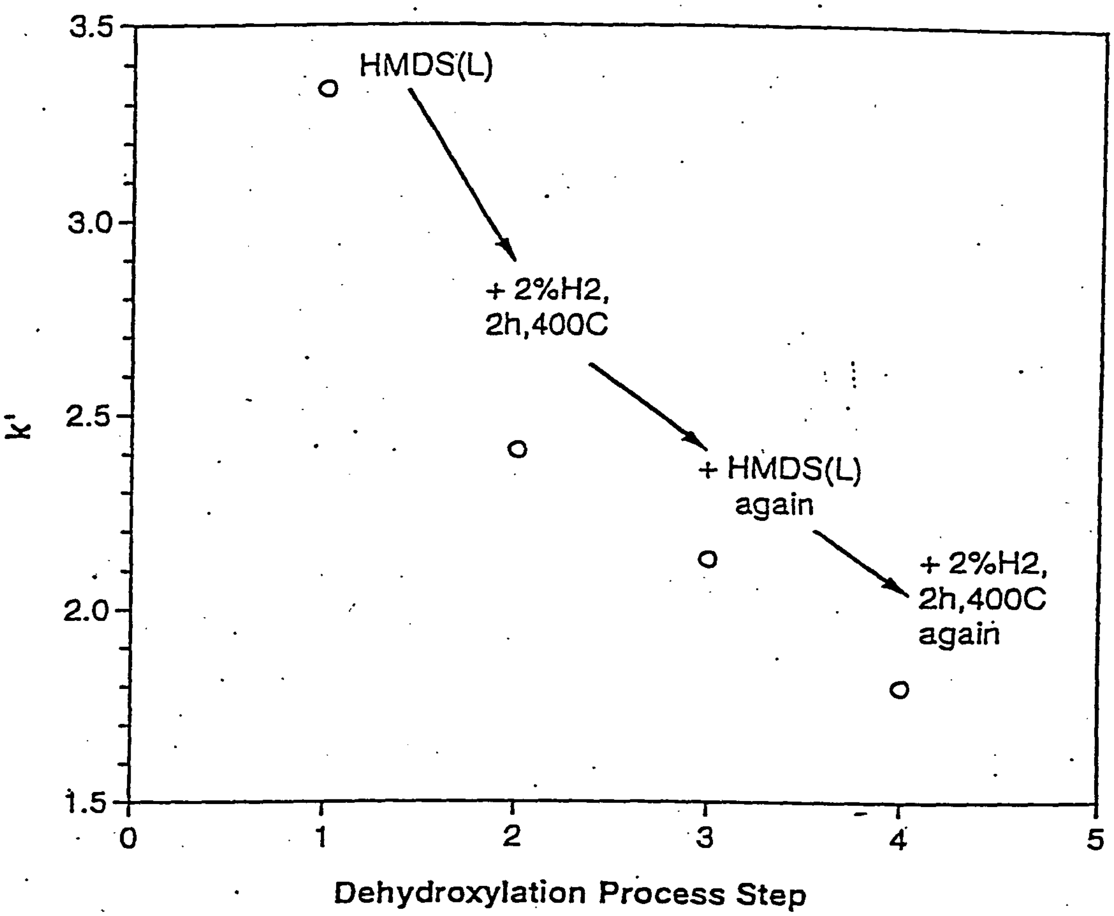
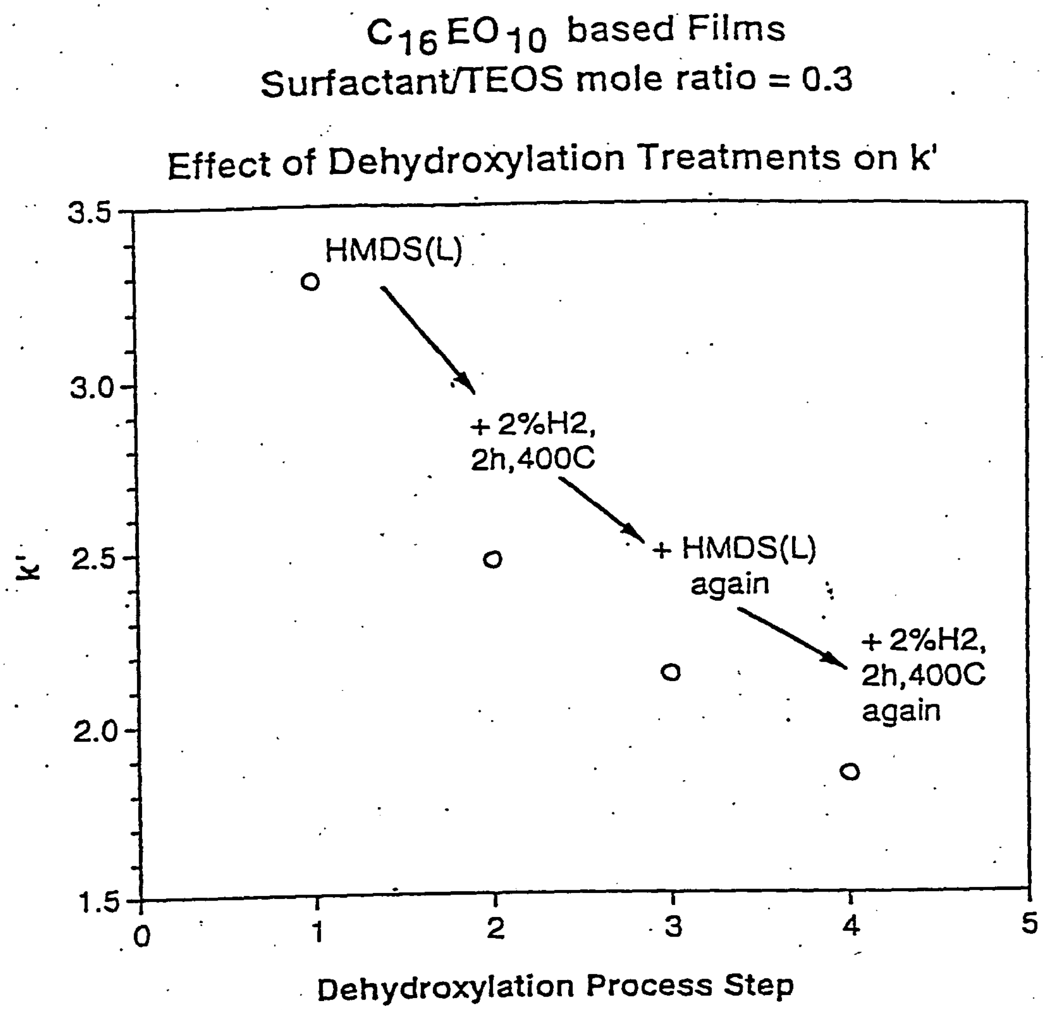


FIG. 2



$C_{16}EO_{10}$ based Films
Surfactant/TEOS mole ratio = 0.3
Effect of Dehydroxylation Treatments on k'
HMDS(L)
+ 2%H2, 2h,400C
+ HMDS(L) again
+ 2%H2, 2h,400C again
k'
3.5
3.0
2.5
2.0
1.5
0
1
2
3
4
5
Dehydroxylation Process Step

FIG. 3

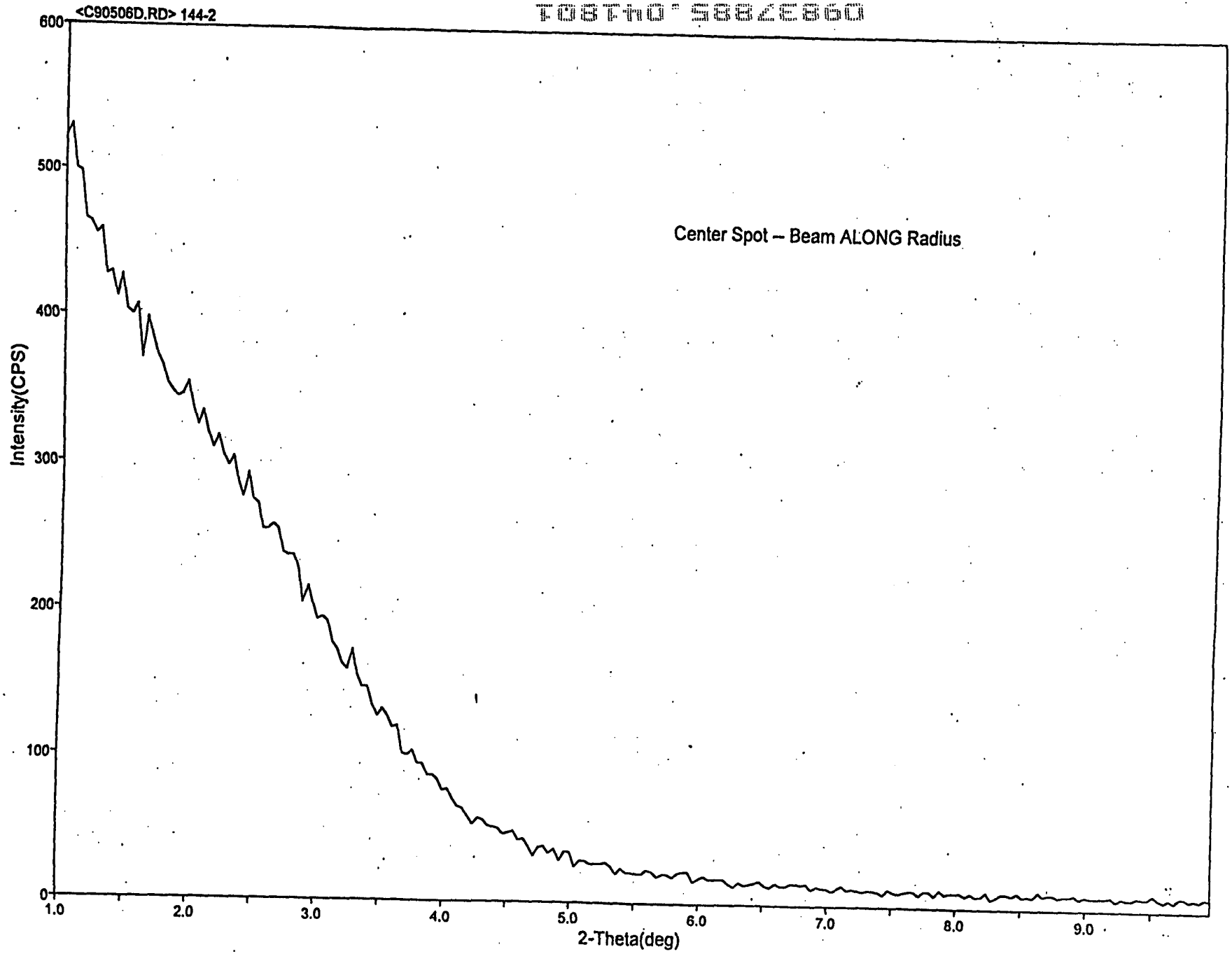


FIG. 4a

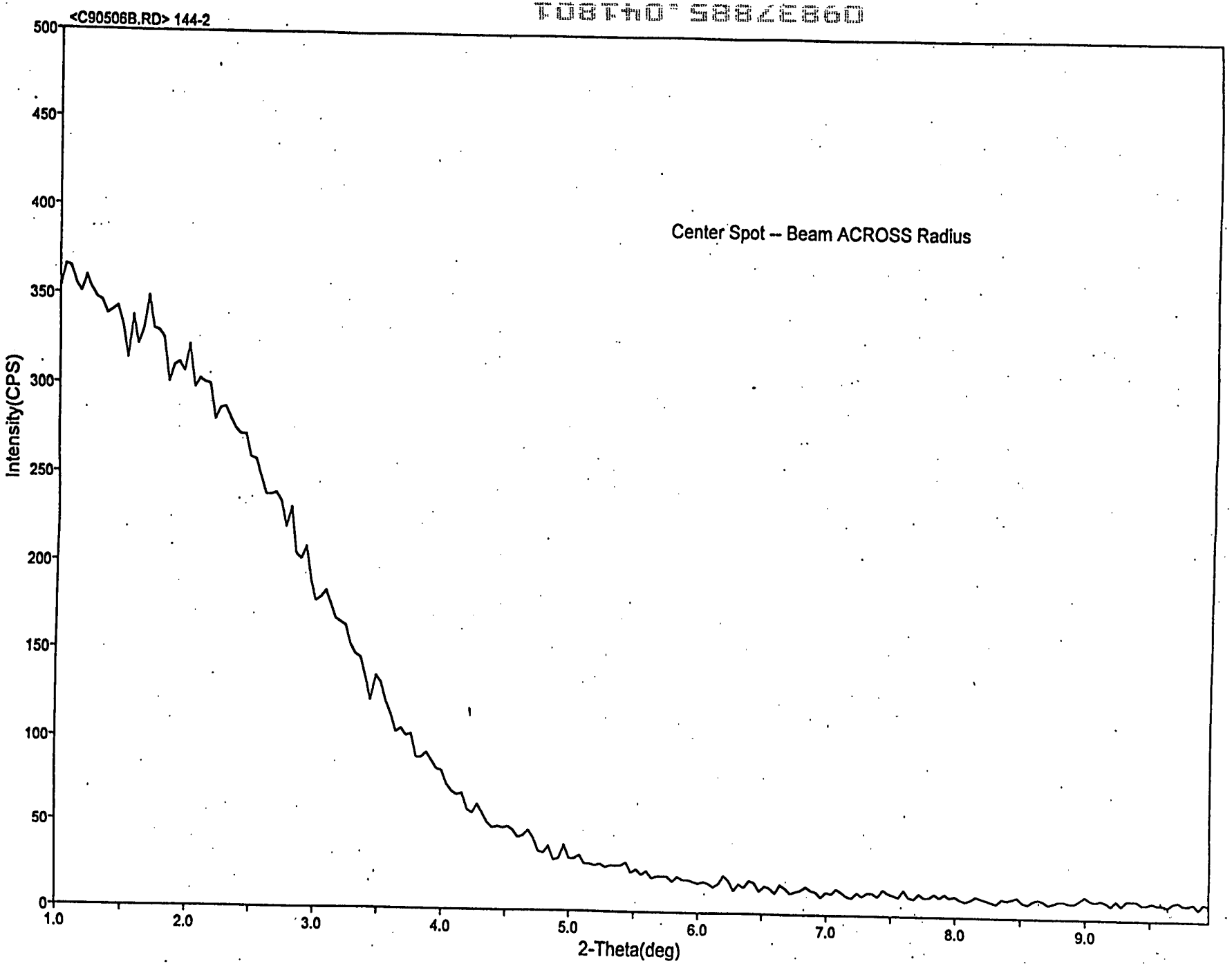


FIG. 4b

TEM micrograph showing ultrafine pores and a disordered pore structure in surfactant-templated mesoporous silica film

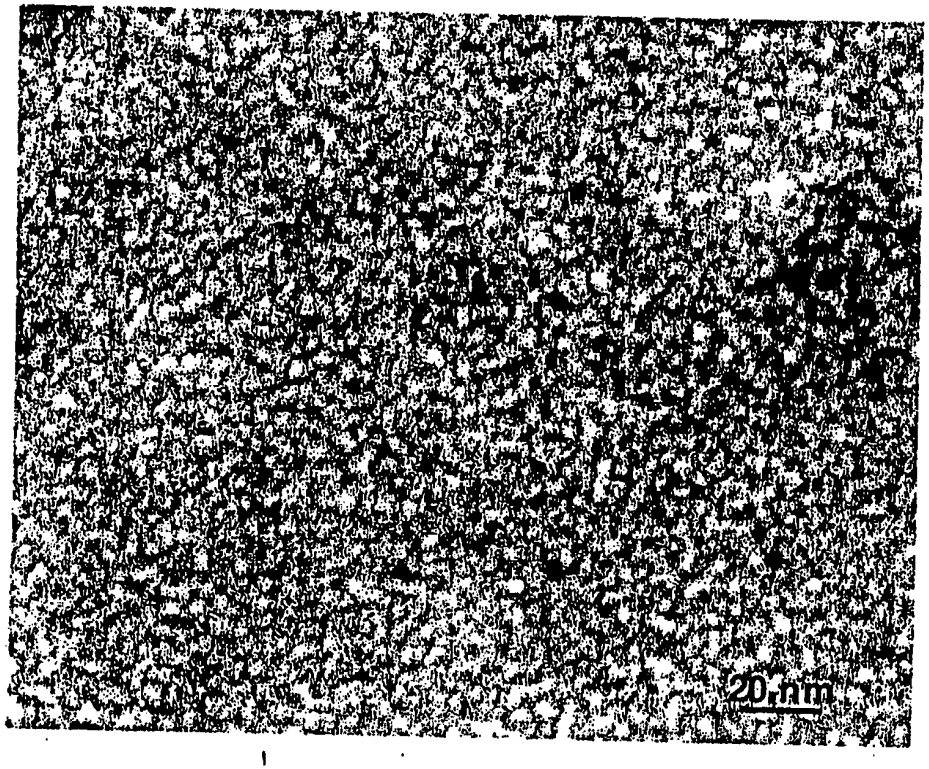


FIG. 5

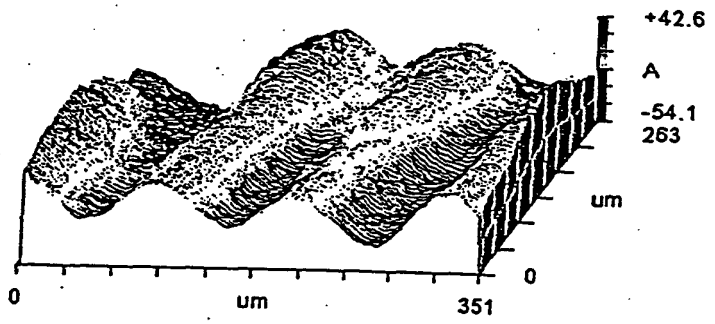


FIG. 6a

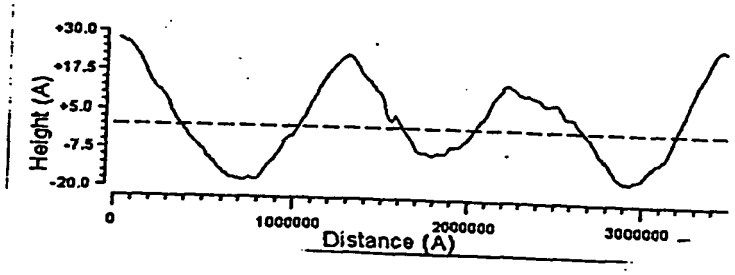


FIG. 6b

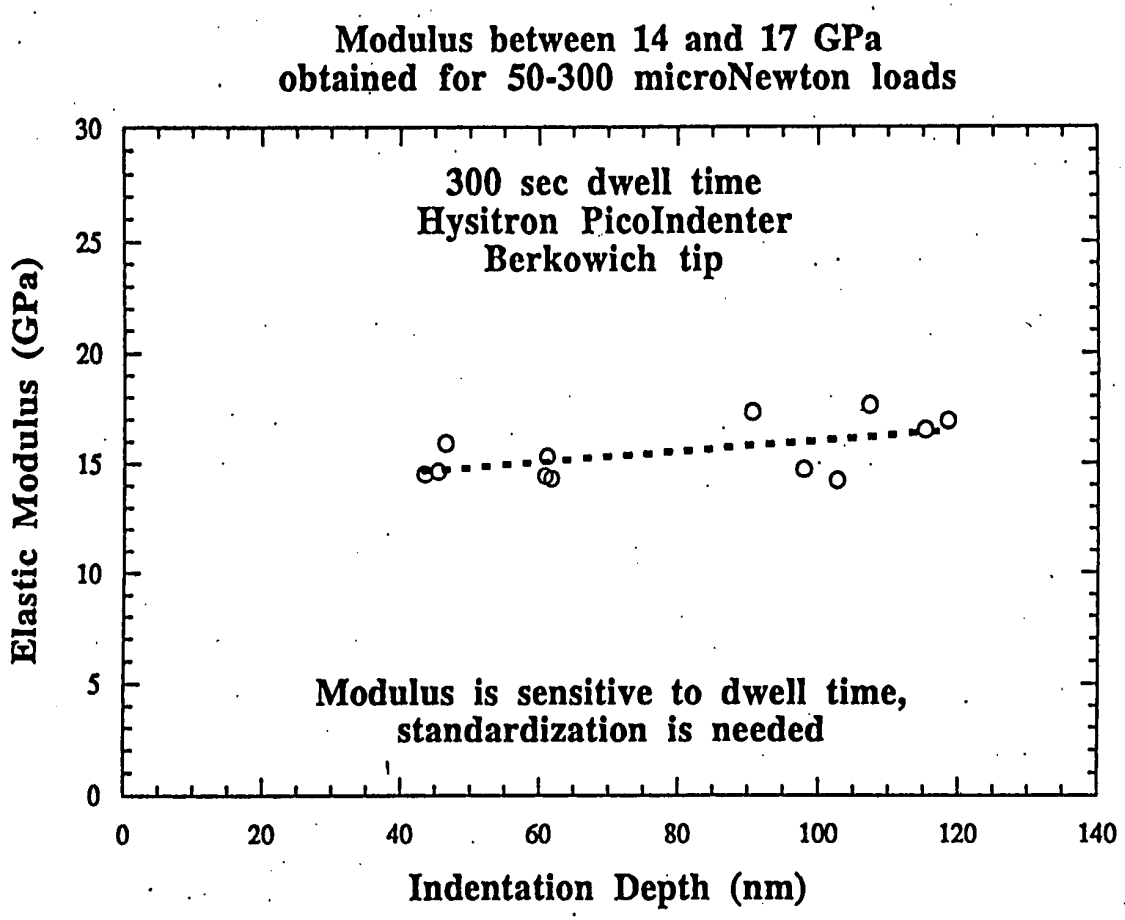

Modulus between 14 and 17 GPa
obtained for 50-300 microNewton loads
300 sec dwell time
Hysitron PicoIndenter
Berkowich tip
Modulus is sensitive to dwell time,
standardization is needed
Elastic Modulus (GPa)
Indentation Depth (nm)
0
5
10
15
20
25
30
0
20
40
60
80
100
120
140

FIG. 7

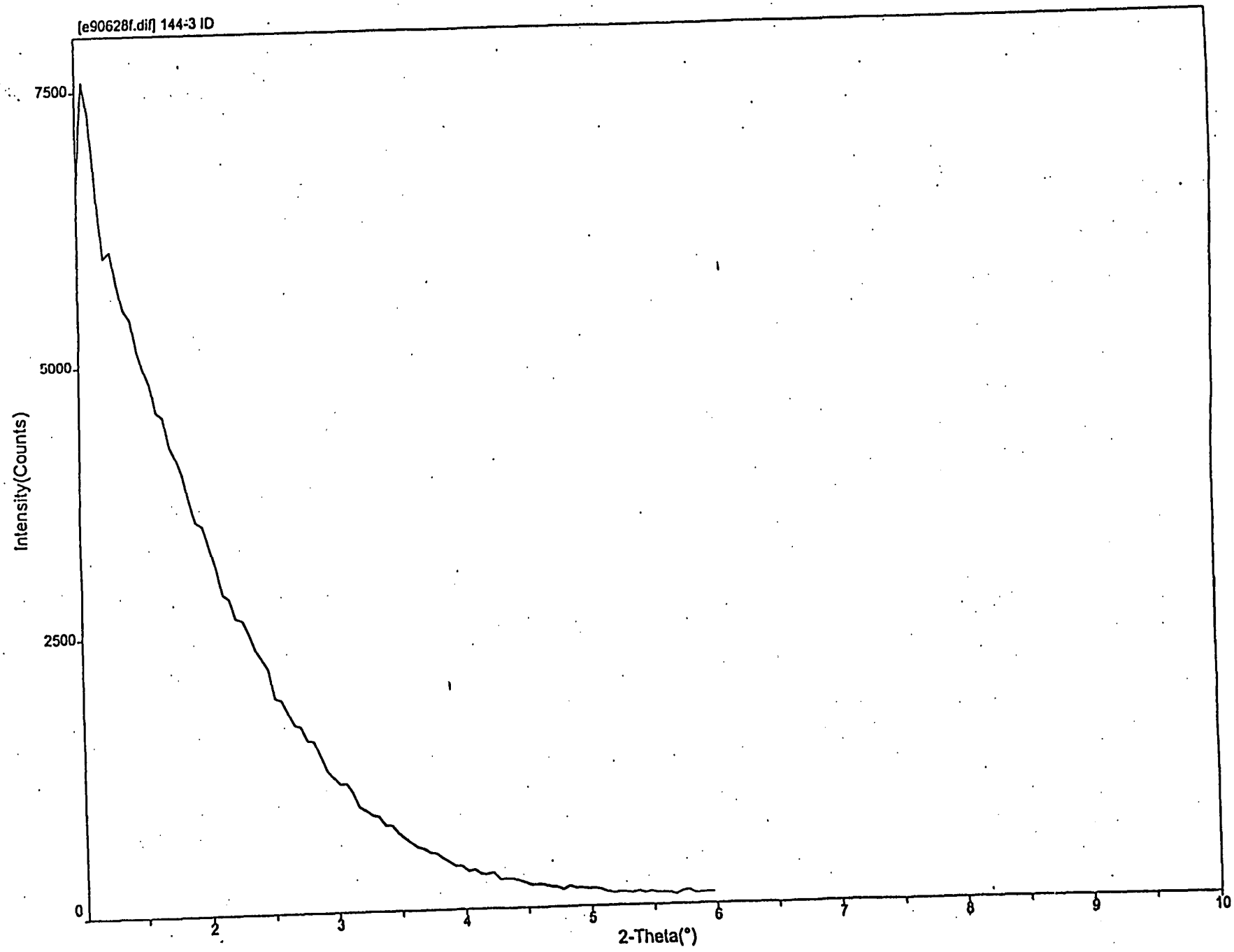


FIG. 8a

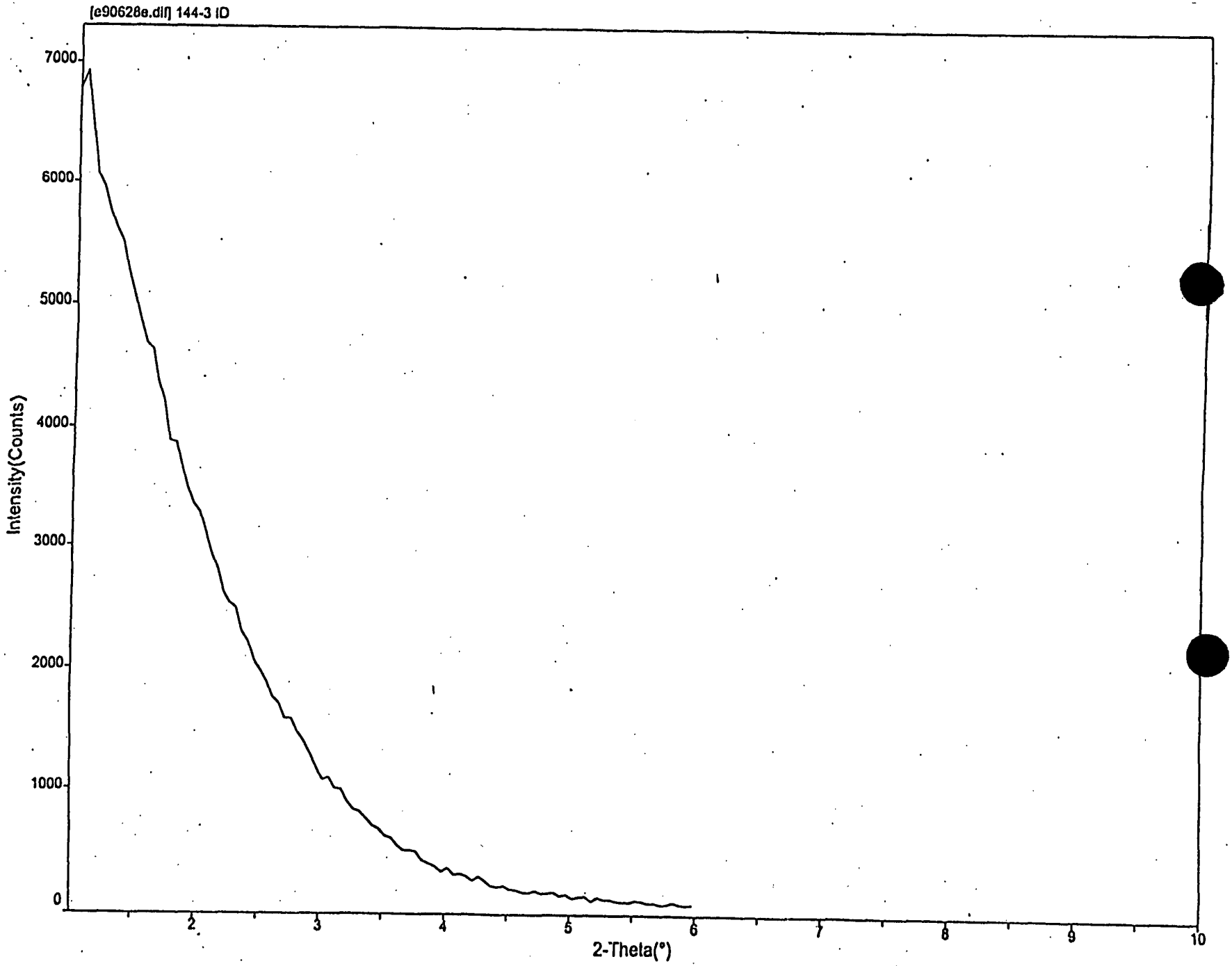


FIG. 8b

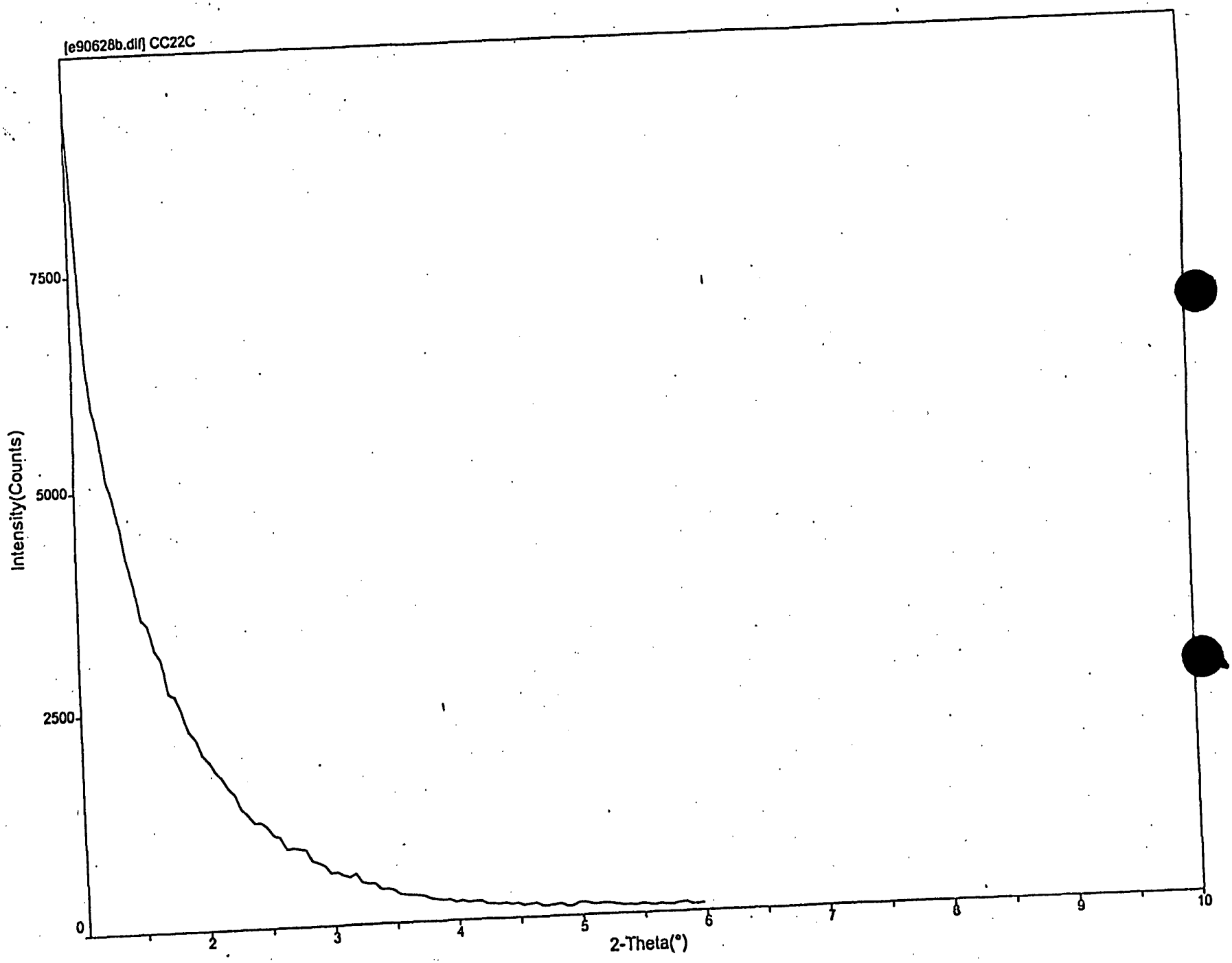


FIG. 9a

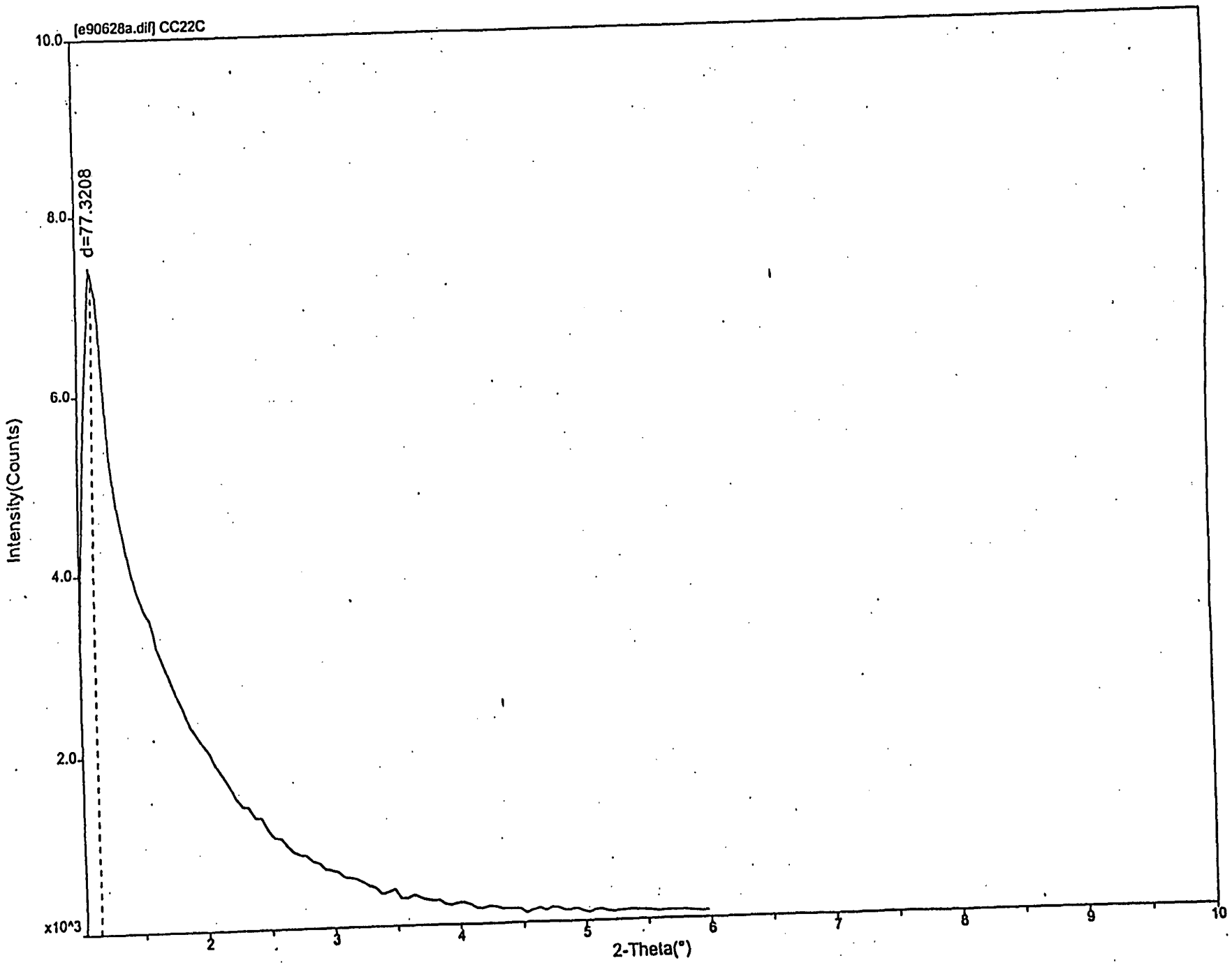


FIG. 9b

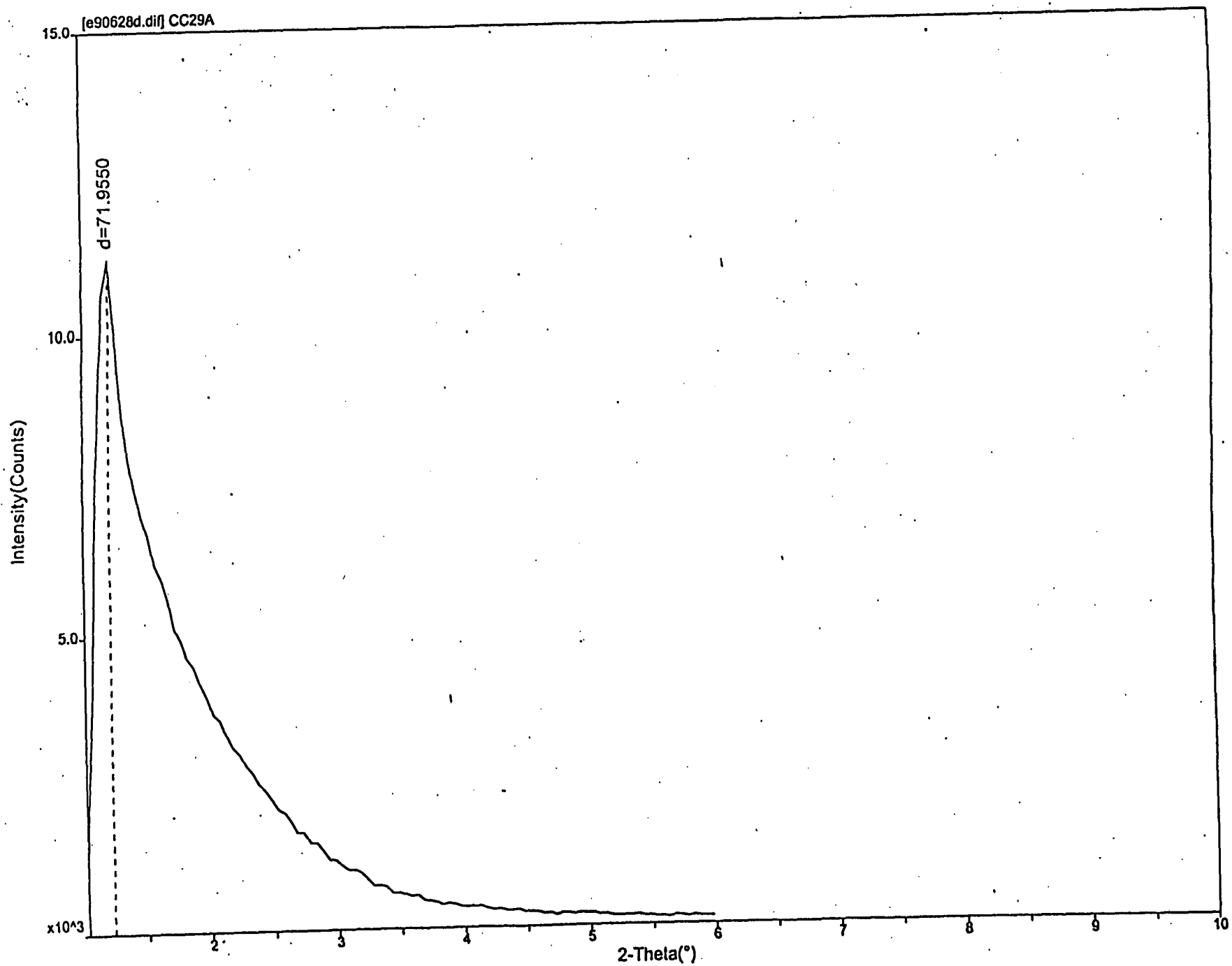


FIG. 10a

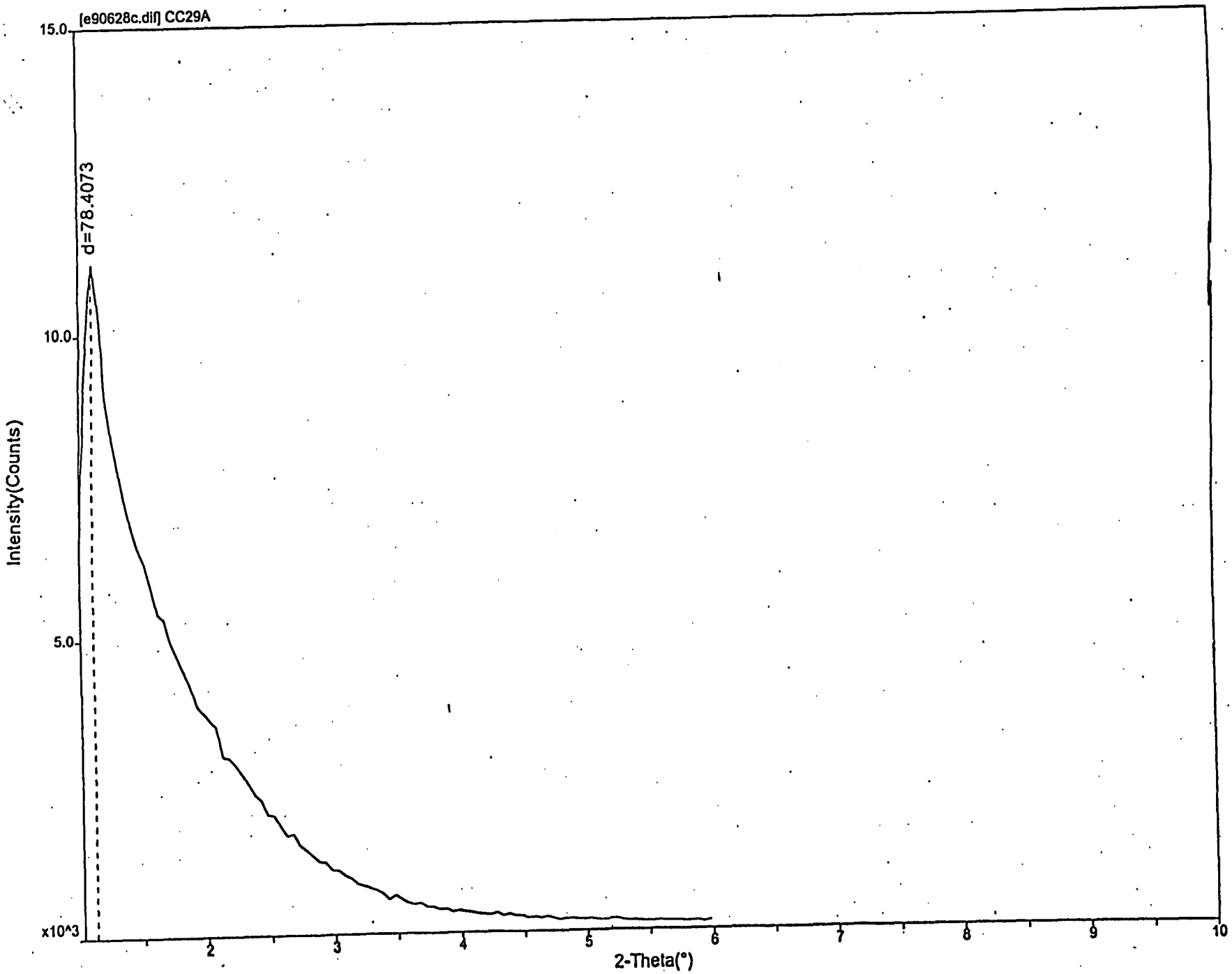


FIG. 10b

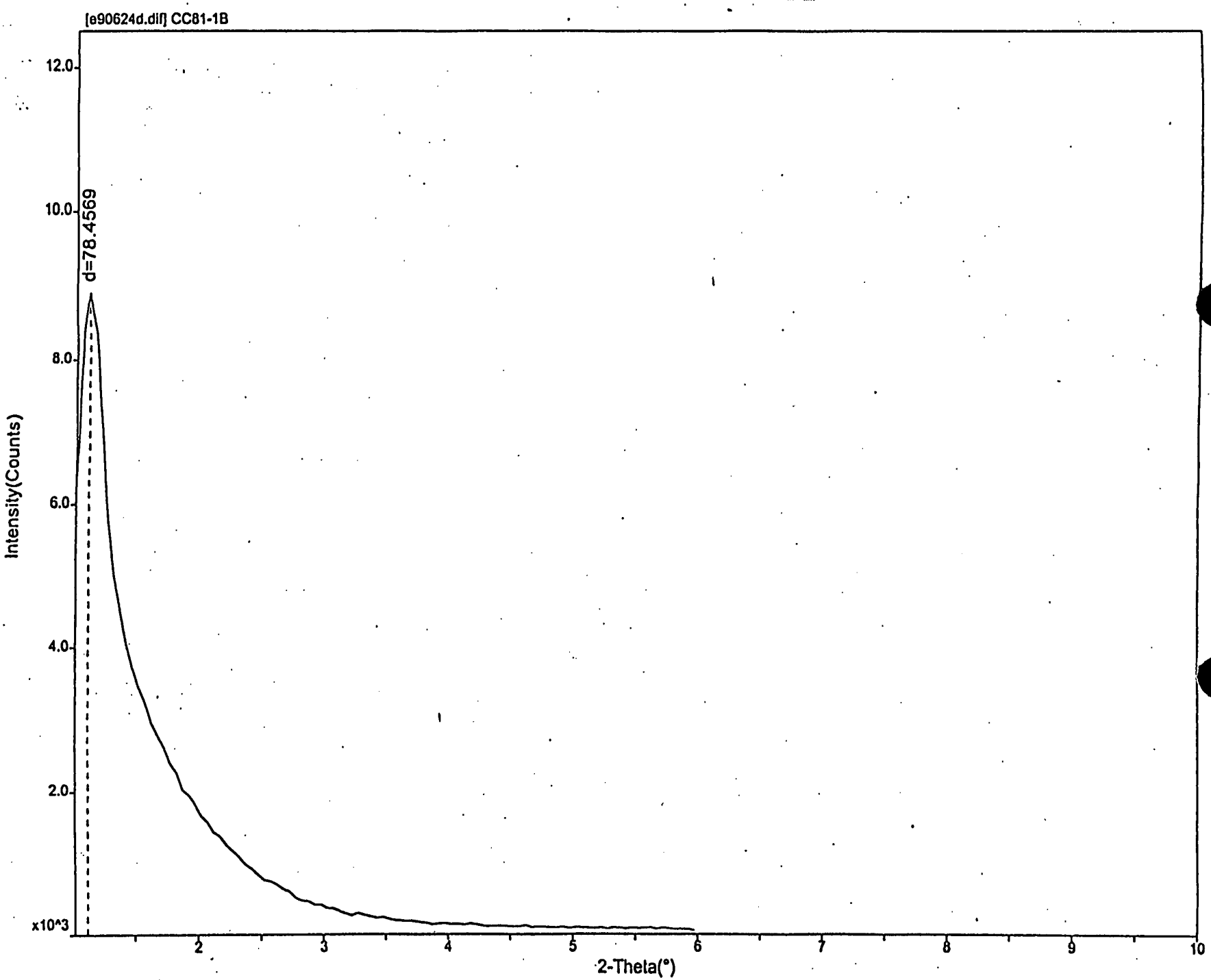


FIG. 11a

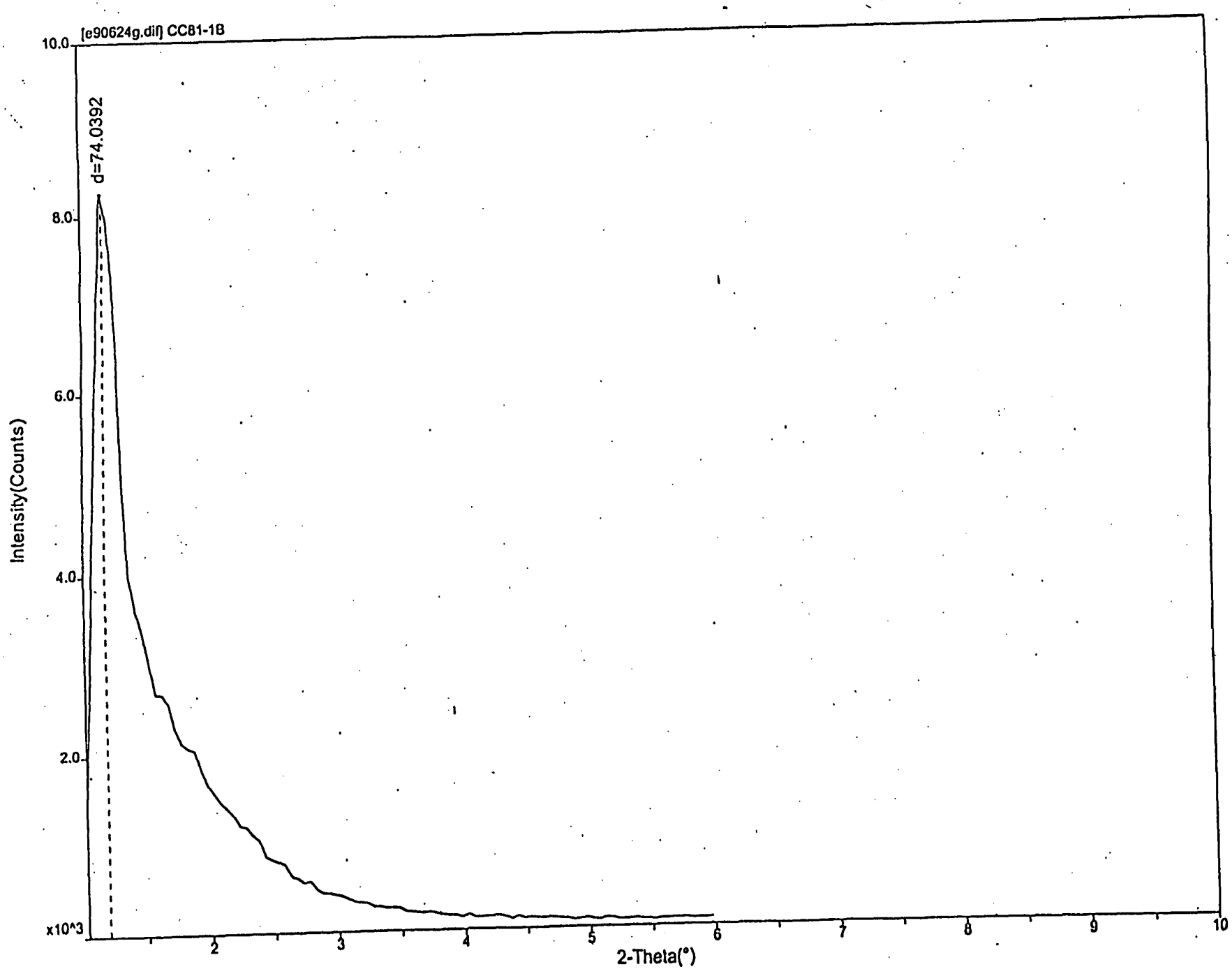


FIG. 11b

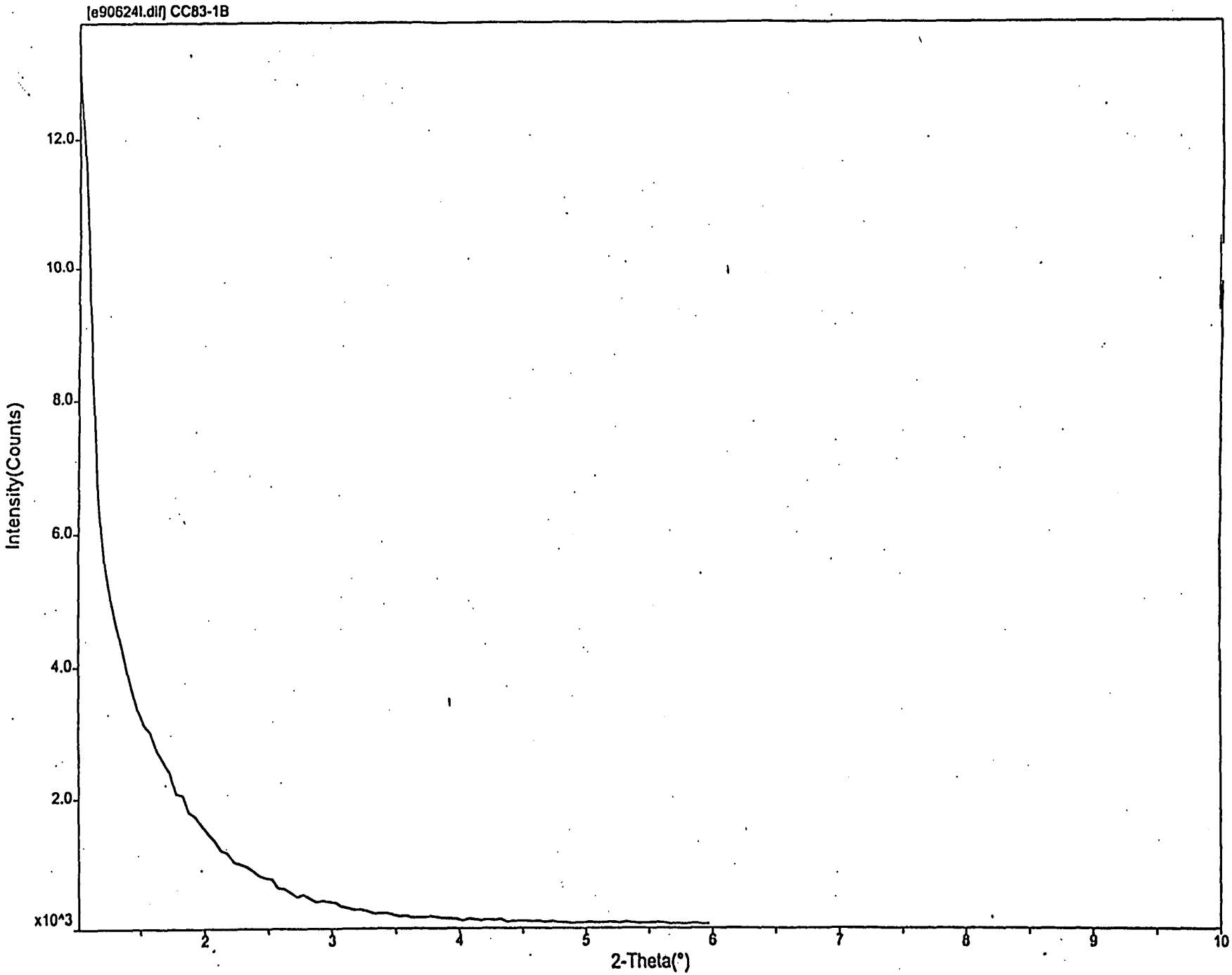


FIG. 12a

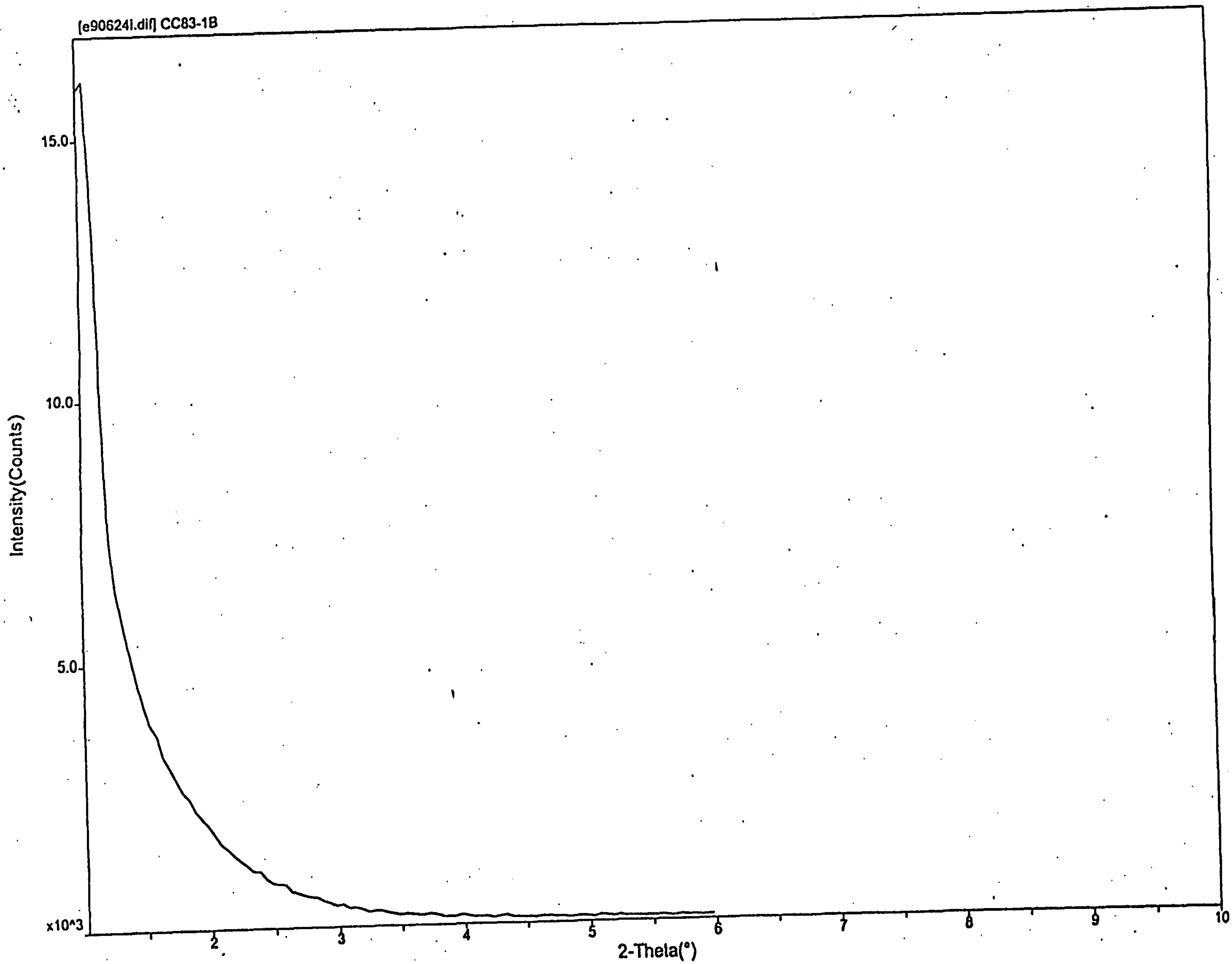


FIG. 17b

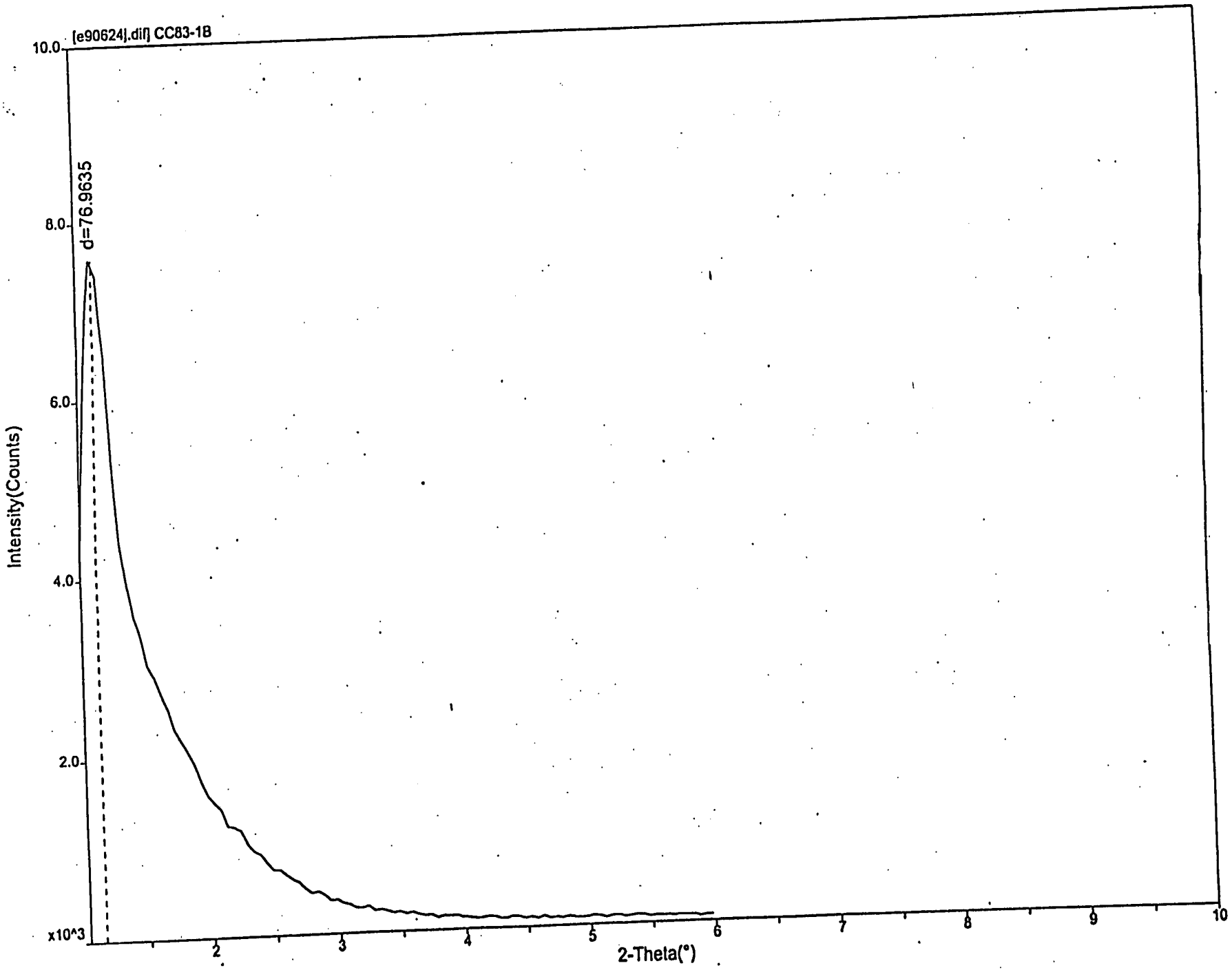


FIG. 12c

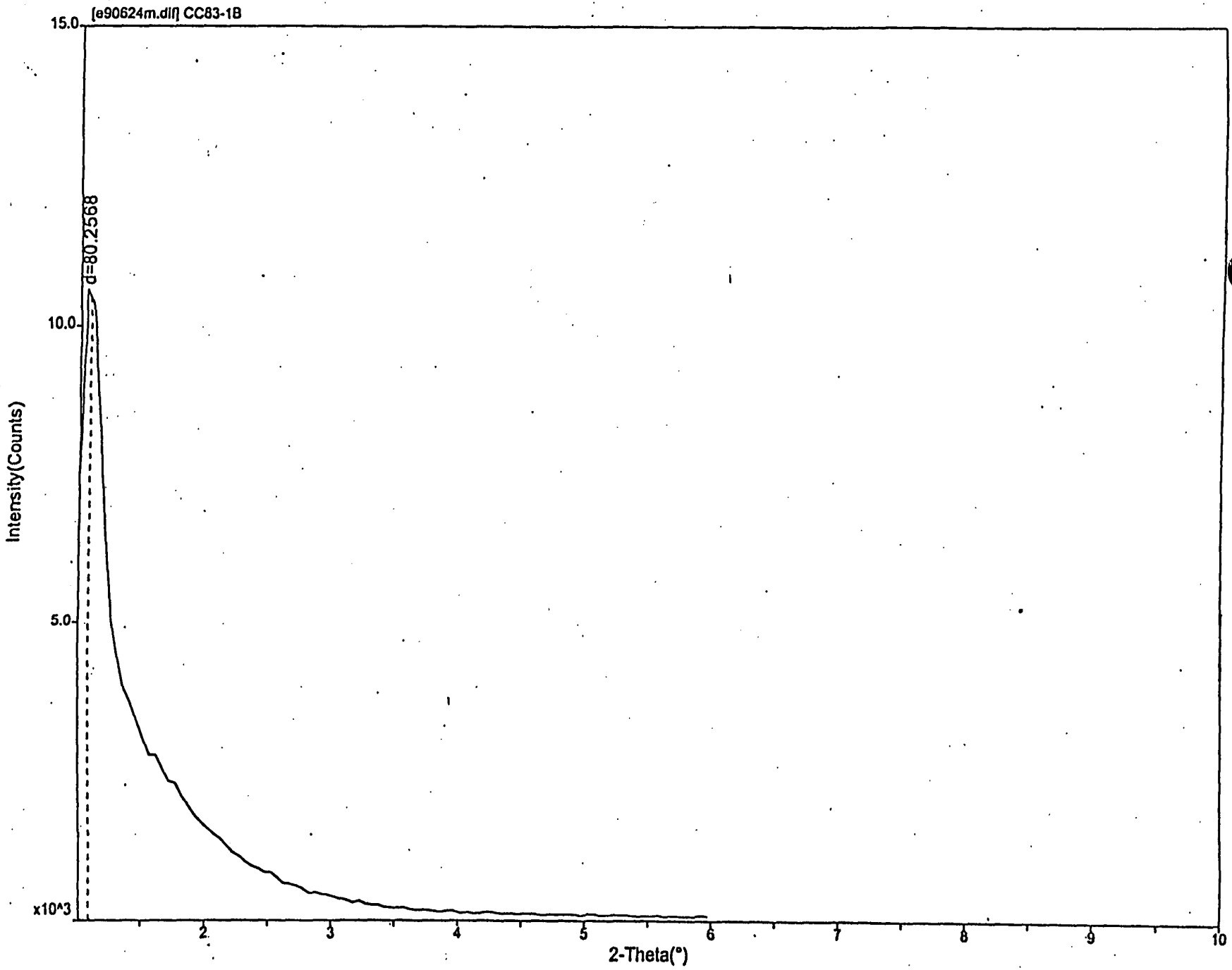


FIG. 12d